



*department of* Conservation and Recreation

# Nantasket Beach Coastal Storm Damage Protection Project

Seawall Toe Protection and Beach Access Enhancements  
Hull, Massachusetts

Massachusetts Wetlands Protection Act  
Notice of Intent  
DEP File # 35-0980

**Addendum to:  
Attachment 6-Project Narrative  
Attachment 7-Project Plans**

January 2007





THE **Louis Berger Group, INC.**

75 Second Avenue, Suite 700, Needham, Massachusetts 02494  
Tel 781 444 3330 Fax 781 444 0099 www.louisberger.com

January 16, 2007

Sheila Conner, Chair  
Conservation Commission  
Town of Hull, Massachusetts  
253 Atlantic Avenue  
Hull, MA 02045

**Re: DEP # 35-0980**  
**Addendum to Project Narrative and Project Plans**  
**Nantasket Beach Coastal Storm Damage Protection Project**  
**Seawall Toe Protection and Beach Access Enhancements**

Dear Ms. Conner and Commissioners:

Enclosed, please find an addendum to the original Notice of Intent filed in November 2006 containing an amended Project Narrative (Attachment 6) and Project Plans (Attachment 7). Authorization to construct the seawall toe protection previously proposed will only be sought in the event of an emergency and is **not** part of the current Notice of Intent. The DCR is currently proposing a number of beach access improvements to correct the existing, unsafe pedestrian access to the beach resulting from the temporary seawall fortification and to improve handicap access to the beach. The beach access improvements will involve the construction of stone stairways at four existing access points and the three new ADA accessible ramps. Additionally, the DCR proposes repairs to the seawall which include the sealing of cracks and joints, repairs to spalling or deteriorated concrete, and the replacement of the existing pipe railing.

Please do not hesitate to contact me if you have any questions.

Craig A. Wood, PWS.  
*Senior Project Manager*

CC: DEP-Southeast Regional Office  
Mike Galvin, DCR  
Division of Marine Fisheries- Gloucester, MA

Attachments: Project Narrative (Attachment 6)  
Project Plans (Attachment 7)





**NANTASKET BEACH COASTAL STORM DAMAGE PROTECTION PROJECT  
SEAWALL TOE PROTECTION AND BEACH ACCESS ENHANCEMENTS**



**AMENDED PROJECT NARRATIVE (ATTACHMENT 6)**





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## PROJECT NARRATIVE

### 1.0 INTRODUCTION AND BACKGROUND

The Nantasket Beach Reservation is located in the Town of Hull, Massachusetts, on Boston's South Shore (Figure 1-1). The Reservation has been used as a recreational beach by Greater Boston residents since the 1800s and was officially established as a public beach in 1899. The Reservation is currently owned and operated by the Massachusetts Department of Conservation and Recreation (DCR). The Reservation includes an oceanfront promenade, parking lots, three bathhouses, and an open pavilion. The beach consists of a sandy barrier beach exposed to the open Massachusetts Bay and Atlantic Ocean. A 5,400-foot seawall along Nantasket Avenue and Hull Shore Drive, which was originally constructed around 1915 and fortified in 1980, protects the Reservation and abutting properties from storm wave erosion and flooding. The seawall is 15 feet in height.

The DCR has undertaken several construction projects in the recent past to address weakened or failed sections of the seawall. In December of 2003, beach erosion caused by two coastal storms severely weakened a 2000-foot southerly section of the seawall which was in imminent threat of failure from erosion and toe scour. In an emergency action, the DCR constructed a stone revetment referred to as Temporary Seawall Fortification (TSF) between June and August of 2004. In 2005, the DCR sought approvals to construct approximately 930 feet of failed or unstable sections of the seawall within the northern end of the Reservation, referred to as Phase 1 of the Nantasket Beach Seawall Rehabilitation Project.

The DCR is currently proposing a number of beach access improvements. The beach access improvements will involve the construction of stone stairways at four existing access points and at three new handicap access ramps (Figure 1-2). The DCR also proposes repairs to the seawall (between Station 30+00 to Station 73+81) which include the sealing of cracks, joint repairs, and repairing spalling or deteriorated concrete. In addition, the existing pipe railing extending linearly along the top of the seawall from Station 30+00 to Station 73+81 will be removed and replaced. Authorization to construct the previously proposed Seawall Toe Protection (STP) between Station 30+00 and Station 50+00 will only be sought in the event of an emergency and is **not** part of the current Notice of Intent.

The DCR is also engaged in the preparation of a master plan for the Reservation which includes (1) landside facilities including parking, traffic, and pedestrian access, user and maintenance facilities in coordination with Reservation needs and community planning efforts, and (2) a more detailed study of coastal processes along the beach to further investigate beach nourishment alternatives. The DCR plans to construct the stairways at four existing points prior to the 2007 beach season. The remaining work would begin during the fall of 2007.



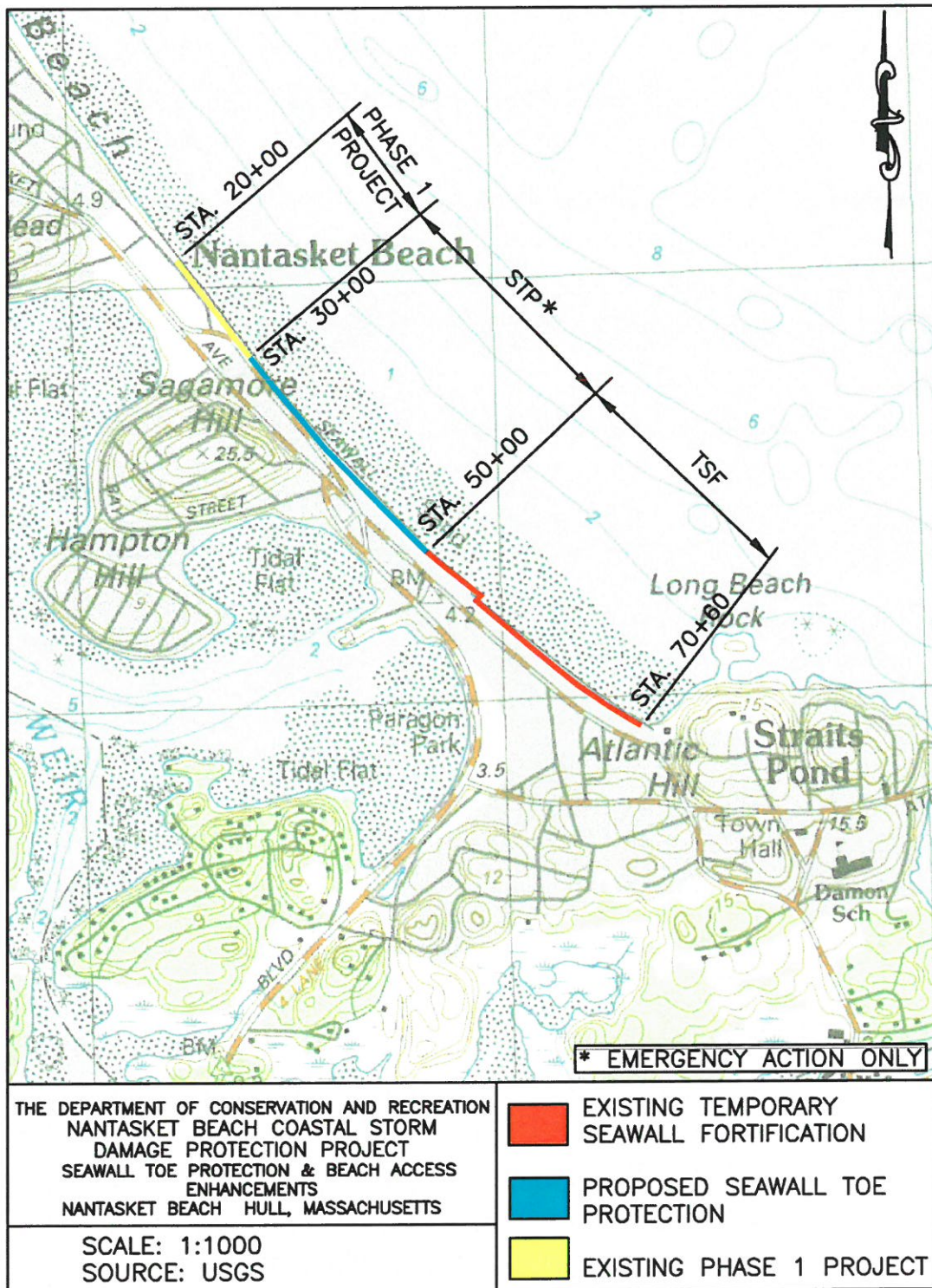


Figure 1-1. Project Site Locus.



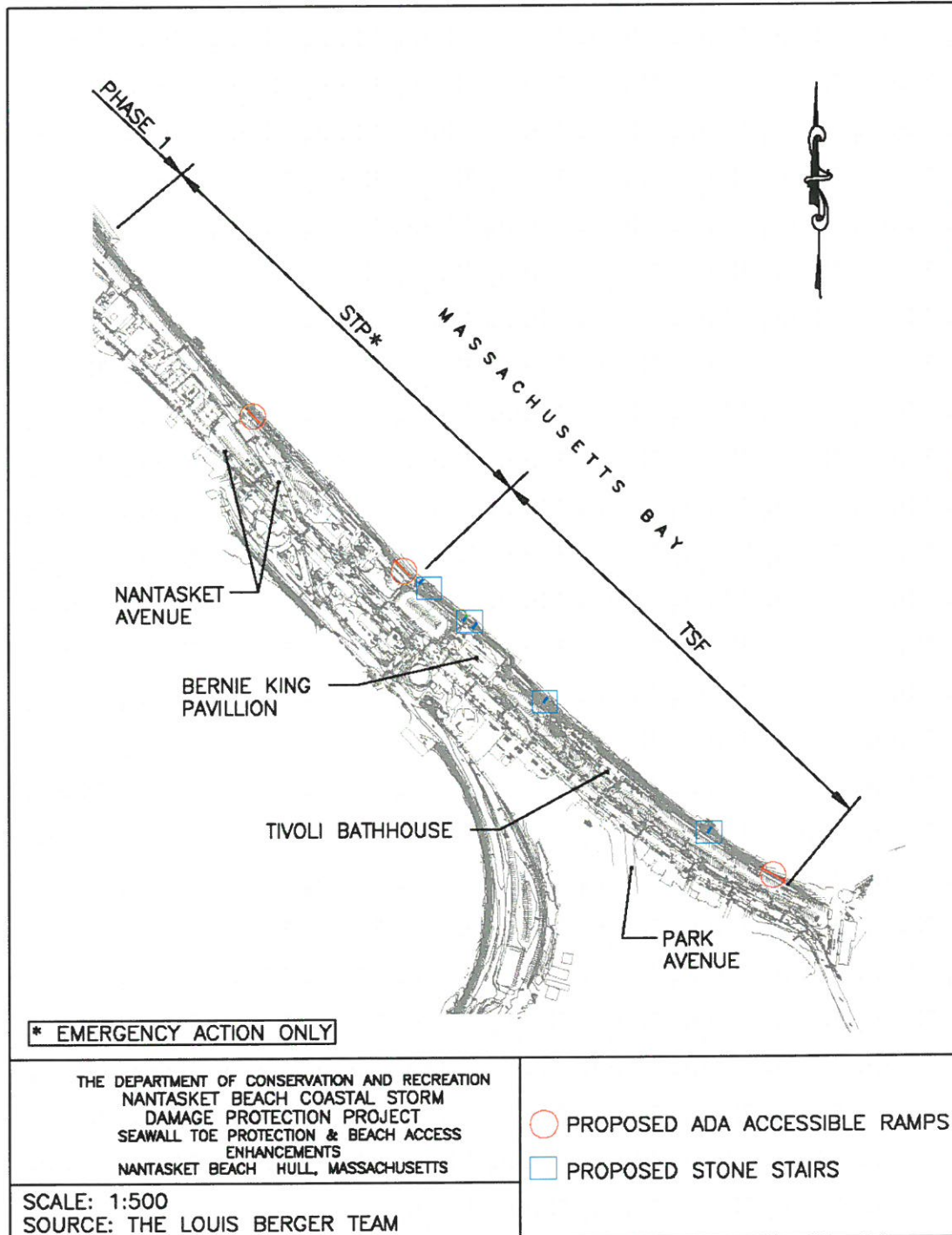


Figure 1-2: Location of Beach Access Enhancements





## **2.0 PROJECT DESCRIPTION AND PURPOSE**

The purpose of the current project is to improve the existing, unsafe pedestrian access to the beach. Safe pedestrian access has been impeded by the installation of the TSF along the 2000-foot southern reach of beach; by the general deterioration of existing stairways and ramps south of the Phase 1 Revetment Project; and by the lack of ADA compliant access ways. In particular, this limited and unsafe access has severely impacted beach users and businesses along the southern reach of the Reservation. As a result, the current Project will repair deteriorated elements at four existing access points along with the construction of cut stone steps with concrete landings within the existing revetment (TSF) to provide safe pedestrian access, and construct three new handicap accessible ramps.

## **3.0 ACCESS ALTERNATIVES**

Several access options to provide pedestrian access to the beach over the uneven revetment stones within the TSF have been considered. These three options are discussed below.

### **3.1 TIMBER WALKWAY**

Timber walkways would consist of pressure-treated lumber structures anchored with bolts installed in revetment stones. Due to the uneven nature of the existing stone revetment, the walkways would need to be field constructed on site and could not utilize pre-fabricated construction. The walkway would be unbolted from its anchorage points and lifted as one or more pieces by a backhoe or other piece of equipment and removed at the end of each beach season. The walkway would be approximately 6 feet in width and would not be fully ADA compliant. While the structures would be relatively easy to repair, they would be susceptible to tidal and storm damage and surfaces may become slippery with algae growth. The seasonal removal and storage of the structures would also be difficult for DCR maintenance crews.

### **3.2 CONCRETE WALKWAY**

Concrete walkways would consist of cast-in-place concrete ramps and/or steps across the face of the stone revetment. This alternative would provide a stable, non-slip, walking surface but would be somewhat difficult to construct as it would be difficult to confine the concrete between the existing large stones. In addition, the concrete would be susceptible to cracking from shifting stones within the revetment. This alternative is also reviewed as the most significant alteration of coastal resources.





### **3.3 PLACED STONE**

This alternative includes the construction of cut stone steps within the stone revetment to give safe beach access from Elevation 10.0 at existing stairs or ramps down to Elevation 1.0. The profile of the steps would be roughly similar to the slope of the revetment and provide similar storm protection. Of the three alternatives, the placed cut stones would be the least susceptible to storm damage and require the least maintenance. The stone steps would be approximately 6 feet wide and have risers between 6 1/2" to 7". This alternative is also considered the most aesthetically appealing alternative. The stone step alternative is also supported by the Nantasket Beach Citizens Advisory Committee (CAC). Based on these factors, the stone step alternative was selected for the current access improvements.

## **4.0 PROPOSED ACTION**

### **4.1 BEACH ACCESS**

Improved beach access through the existing TSF will occur at 4 of the existing beach access points between Station 30+00 and the end of the beach at Station 73+81 where one of the new ADA accessible ramps is being constructed (see Figures 1-2, 4-1 and 4-2 and Attachment 7- Project Plans). The proposed cut stone steps will be constructed to provide safe beach access from Elevation 10.0 at existing stairs or ramps down to Elevation 1.0. The stone steps are to be a minimum of 6 feet wide and have risers between 6 1/2" to 7". Stone steps below Elevation 5 will generally be re-buried with sand. A concrete landing is proposed in order to provide a level transition. The only maintenance requirements for the steps is the periodic removal of cobbles to improve pedestrian safety.

### **4.2 ADA ACCESSIBLE RAMPS**

Three new ADA accessible ramps will be constructed at the existing Vehicle Ramp No. 1 location (Station 39+37), existing Stairway No. 6 (Station 49+89), and existing Ramp No. 9 (Station 70+09). These ramps will be constructed by placement of a sheet-pile wall extending perpendicular to the existing seawall for approximately 9 feet, and then turning to run parallel to the existing seawall in a southerly direction for approximately 135 feet. The ADA accessible ramps will slope from approximately elevation 15.0 to elevation 4.0. A concrete cap will encase the sheet-pile to about elevation 16.5. The elevation of the STP and sheeting pile wall will decrease consistent with the slope of the handicapped access to about elevation 4.0. The reconstruction of the existing Ramp No. 9 will extend beyond the southern limit of the TSF and therefore will not require cut stone steps to provide safe access over the stone revetment.

Minor repairs to the seawall, which includes the sealing of cracks, joint repairs, and repairing spalling or deteriorated concrete, will be made from Station 30+00 to Station 73+81 at the southern end of the beach



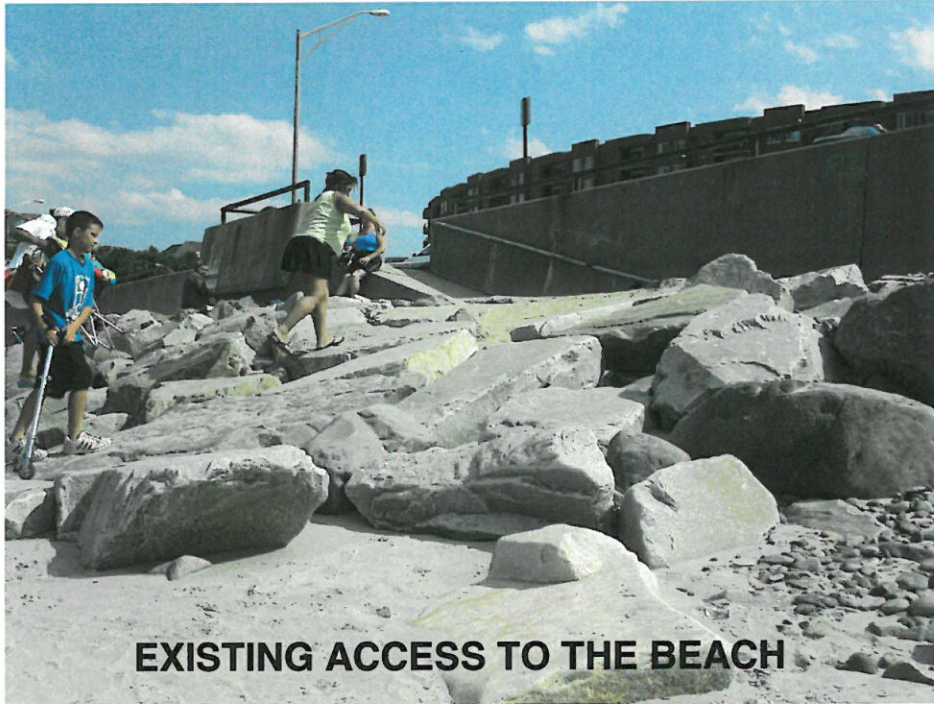


Figure 4-1. Images of existing and proposed access at stairways.





**Figure 4-2. Images of existing and proposed access at ramps.**





#### 4.3 CONSTRUCTION SEQUENCE

The following represents a general construction sequence of the proposed work:

- Designated work areas of the beach including sections of adjacent parking lot will be closed to allow for construction within the work area to proceed.
- Remove and dispose of existing concrete debris at four proposed access points.
- Where applicable, remove revetment stone.
- Construct cut stone stairs and landing.
- Remove and dispose of existing concrete debris at three proposed ADA compliant ramps.
- Construct ADA accessible ramps by driving sheeting, form and place concrete cap, and place gravel fill in layers not exceeding 6 inches compacted thickness. Place cement concrete masonry and reinforcing steel.
- Where applicable, replace beach sand in-kind.
- Repair existing seawall, including sealing of cracks, joint repairs and repairing spalled / deteriorated concrete.
- Remove and replace the existing railing along the top of the existing seawall.

#### 5.0 RESOURCE AREAS AND ANTICIPATED IMPACTS

The construction of the proposed improvements to the existing, inadequate and unsafe beach access will result in both temporary and permanent impacts to "Coastal Beach". Coastal Beaches are defined by the Massachusetts Wetlands Protection Act Regulations (310 Code of Massachusetts Regulations 10.00) as "unconsolidated sediment subject to wave, tidal and coastal storm action which forms the gently sloping shore of a body of salt water and includes tidal flats. Coastal Beaches extend from the mean low water line landward to the dune line, coastal bankline or the seaward edge of existing man-made structures, when these structures replace one of the above lines, whichever is closest to the ocean."

310 CMR 10.00 states that coastal beaches serve the purposes of storm damage prevention and flood control by dissipating wave energy, by reducing the height of storm waves, and by providing sediment to supply other coastal features, including coastal dunes, land under the ocean and other coastal beaches. Interruptions of these natural processes by man-made structures reduce the ability of the coastal beach to perform these functions. For those projects reviewed under 310 CMR 10.30(3)(a) the WPA regulations state that a coastal engineering structure or a modification thereto shall be designed and



constructed so as to minimize, using best available measures, adverse effects on adjacent or nearby coastal beaches due to changes in wave action, shall not have an adverse effect by increasing erosion, decreasing the volume or changing the form of any such coastal beach or an adjacent or downdrift coastal beach.

The proposed access improvements serve the interests of the Massachusetts Protection Act (WPA) by correcting the unsafe access problems associated with an existing seawall, and meets all applicable performance standards. The work necessary to construct the cut stone steps and a concrete landing at the four existing access points is considered temporary as the proposed work takes place within the footprint of the existing revetment (TSF). The stone steps will create a combined 910 square feet of temporary impact as measured from the seaward face of existing seawall. The work necessary to construct the ADA compliant ramps is considered permanent. Permanent impacts as a result of the three ADA compliant ramps total 5,610 square feet.

## **6.0 PROPOSED MITIGATION MEASURES**

Several mitigating measures are proposed to further minimize potential impacts associated with construction of the proposed access improvements. These measures include:

- Time of Year Restriction - All work in water shall not occur from May 1st to October 15th in order to minimize adverse affects to fish habitat. In general, all work will be performed during periods of low tide to avoid any work within water.
- Storm Damage Prevention – The contractor shall time work activity to avoid storms, high tides, and other factors that could result in adverse impacts to the resource areas.
- Equipment Maintenance - There shall be no servicing, fueling, maintenance, or storage of equipment on the beach or within 25 feet of access points.
- Material Storage/Stockpile - No construction material storage or stockpiling is to be permitted on the beach except for the stockpiling of the existing sand to be excavated and backfilled or large cut stones to be placed within the revetment. All construction materials will be removed from the beach daily.



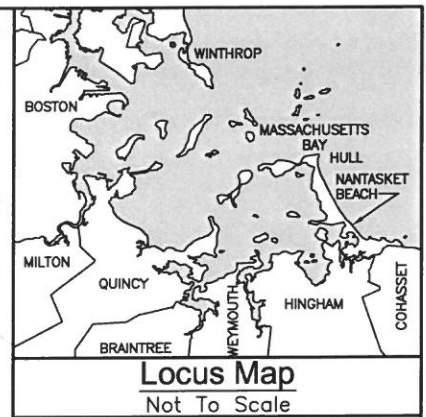


**NANTASKET BEACH COASTAL STORM DAMAGE PROTECTION PROJECT  
SEAWALL TOE PROTECTION AND BEACH ACCESS ENHANCEMENTS**



**AMENDED PROJECT PLANS (ATTACHMENT 7)**

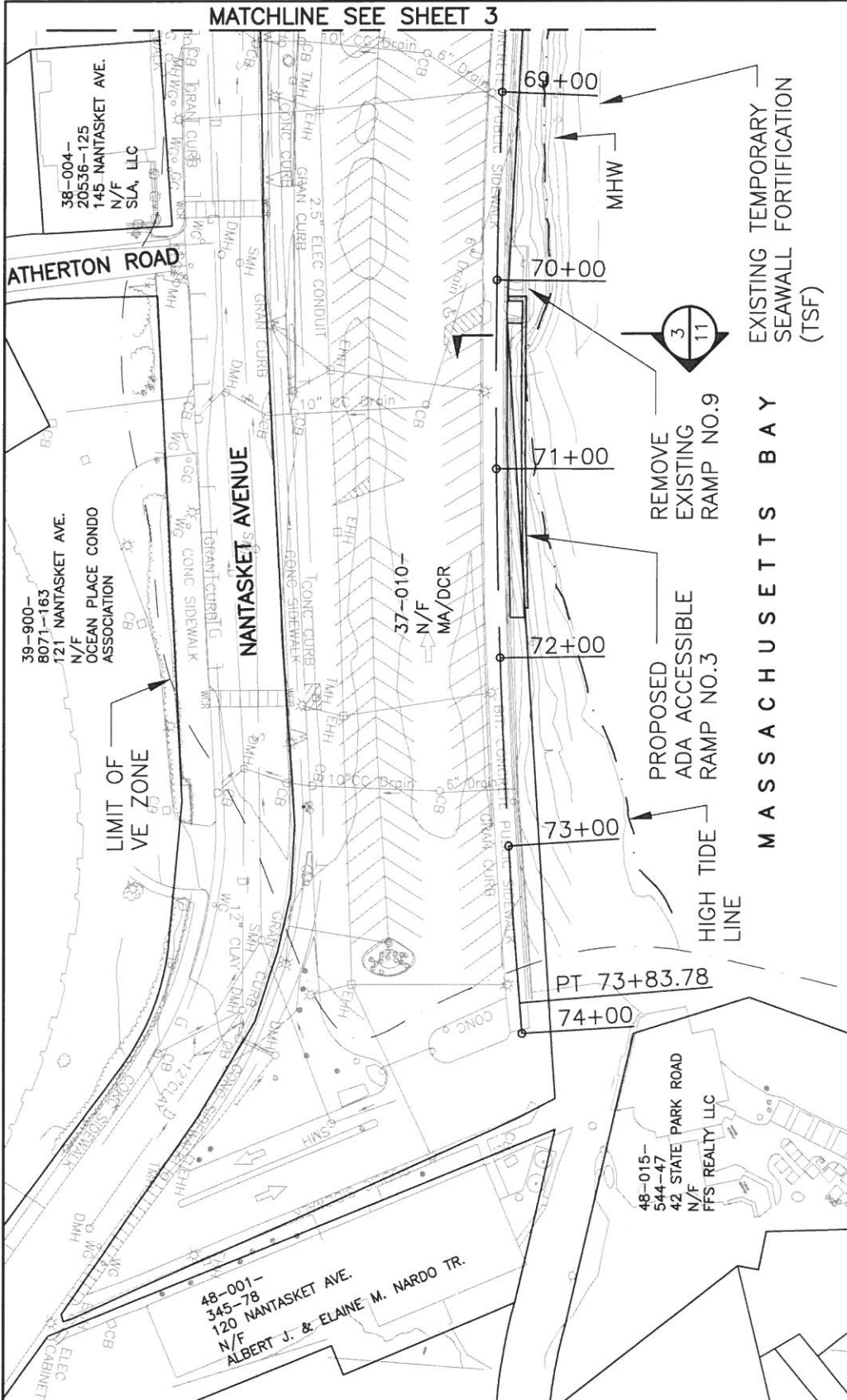




Date: JANUARY 2007



MATCHLINE SEE SHEET 3



PLAN 1 OF 7

1" = 80'

NOTE:  
MLW IS APPROX.  $\pm 400'$   
FROM FACE OF SEAWALL

NOTE:  
PROPERTY LINE AND  
ADDITIONAL INFORMATION IS  
BASED UPON INFORMATION  
PROVIDED BY THE TOWN OF  
HULL IN OCTOBER 2006

160 FEET

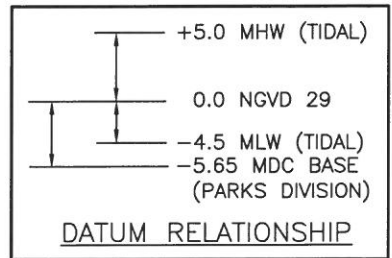
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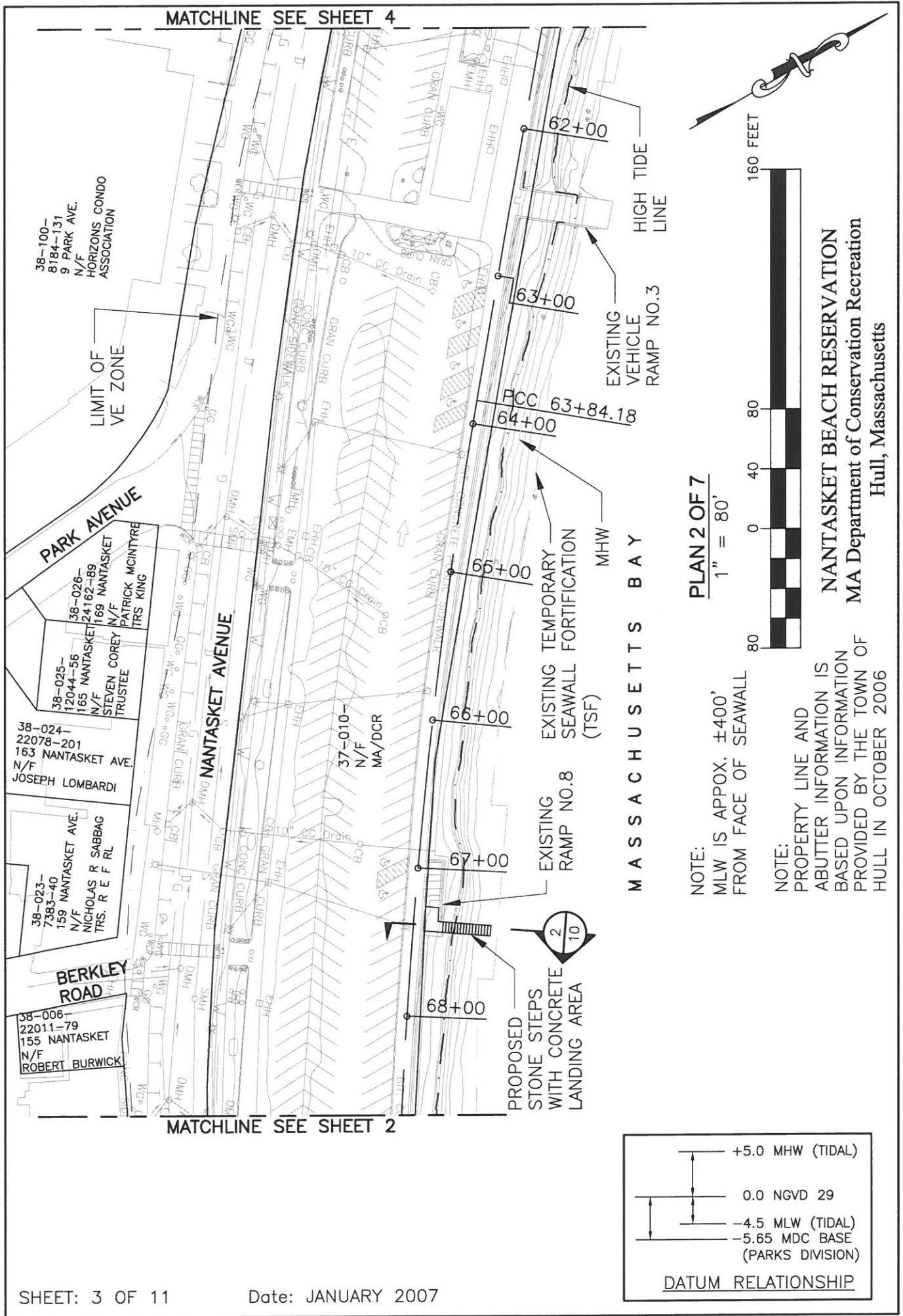
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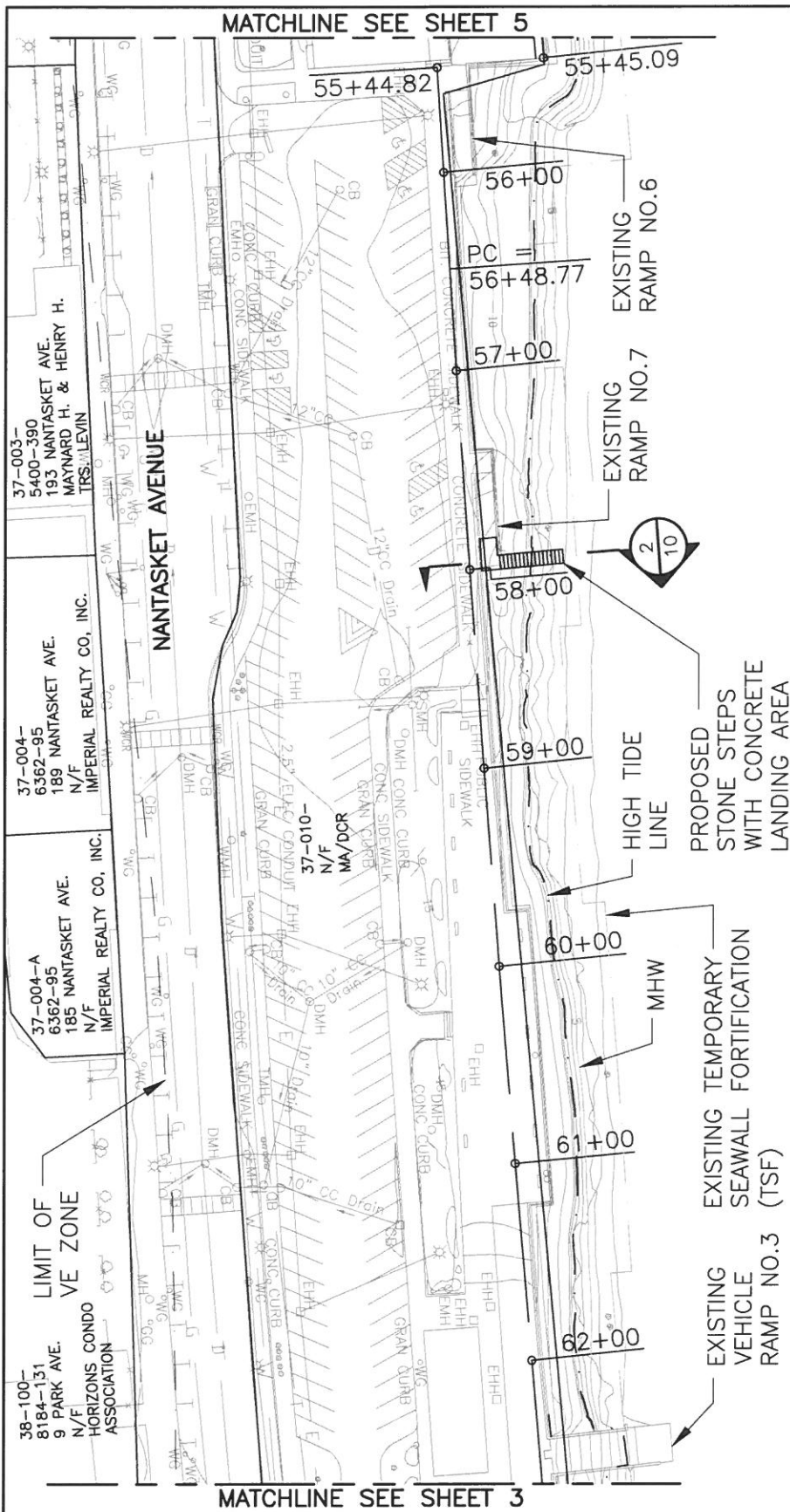
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**NANTASKET BEACH RESERVATION**  
MA Department of Conservation Recreation  
Hull, Massachusetts









M A S S A C H U S E T T S B A Y

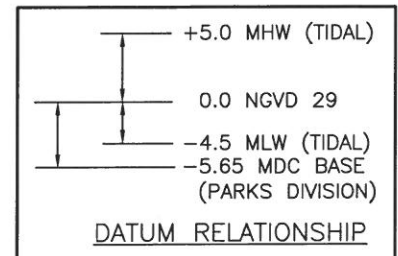
PLAN 3 OF 7  
1" = 80'



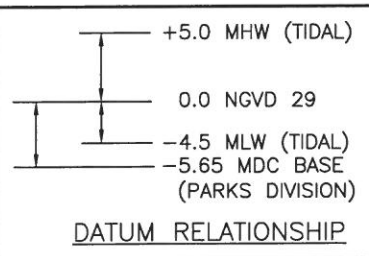
NOTE:  
MLW IS APPROX.  $\pm 400'$   
FROM FACE OF SEAWALL

NOTE:  
PROPERTY LINE AND  
ADDITIONAL INFORMATION IS  
BASED UPON INFORMATION  
PROVIDED BY THE TOWN OF  
HULL IN OCTOBER 2006

NANTASKET BEACH RESERVATION  
MA Department of Conservation Recreation  
Hull, Massachusetts



MATCHLINE SEE SHEET 4



NOTE:  
PROPERTY LINE AND  
ABUTTER INFORMATION IS  
BASED UPON INFORMATION  
PROVIDED BY THE TOWN OF  
HULL IN OCTOBER 2006



NANTASKET BEACH RESERVATION  
MA Department of Conservation Recreation  
Hull, Massachusetts

MASSACHUSETTS BAY

Date: JANUARY 2007







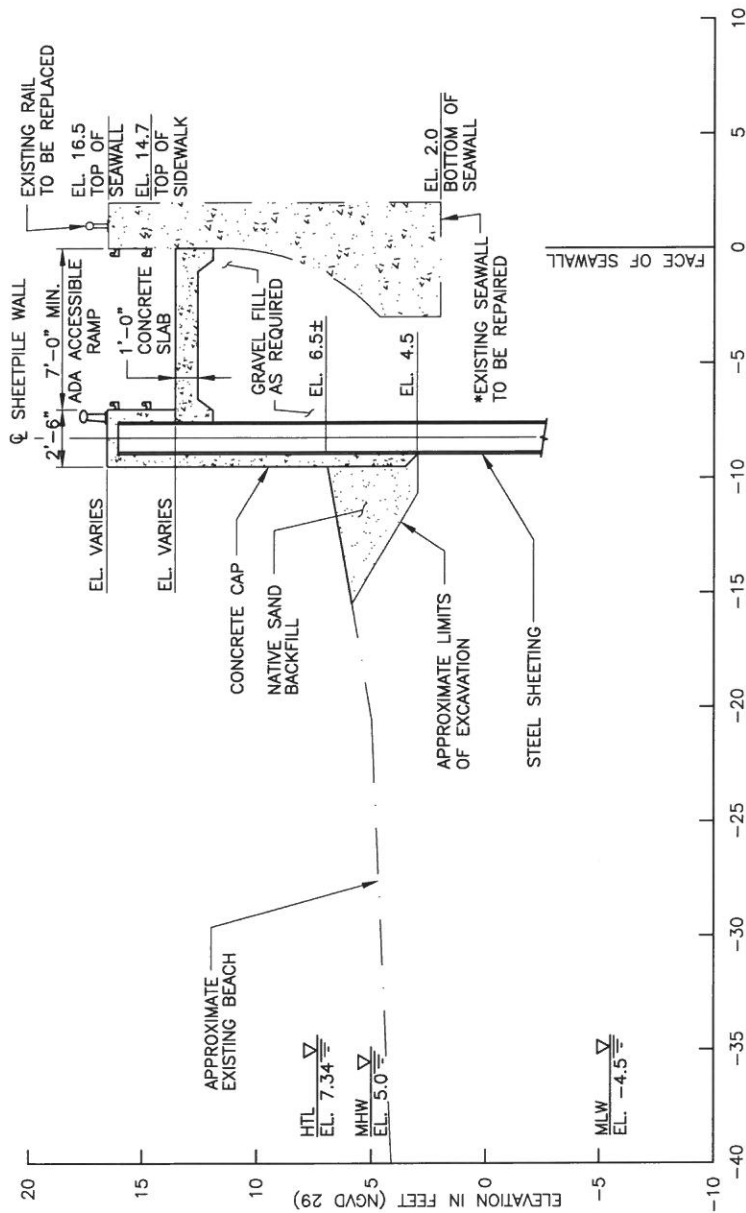
Diagram illustrating datum relationships:

- +5.0 MHW (TIDAL)
- 0.0 NGVD 29
- 4.5 MLW (TIDAL)
- 5.65 MDC BASE (PARKS DIVISION)

DATUM RELATIONSHIP



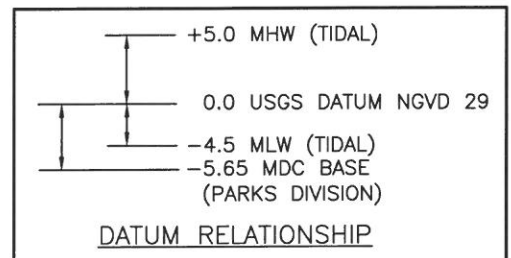
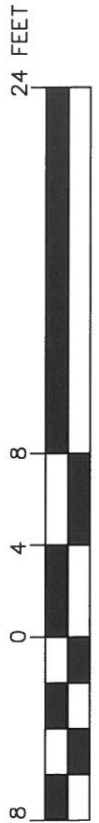




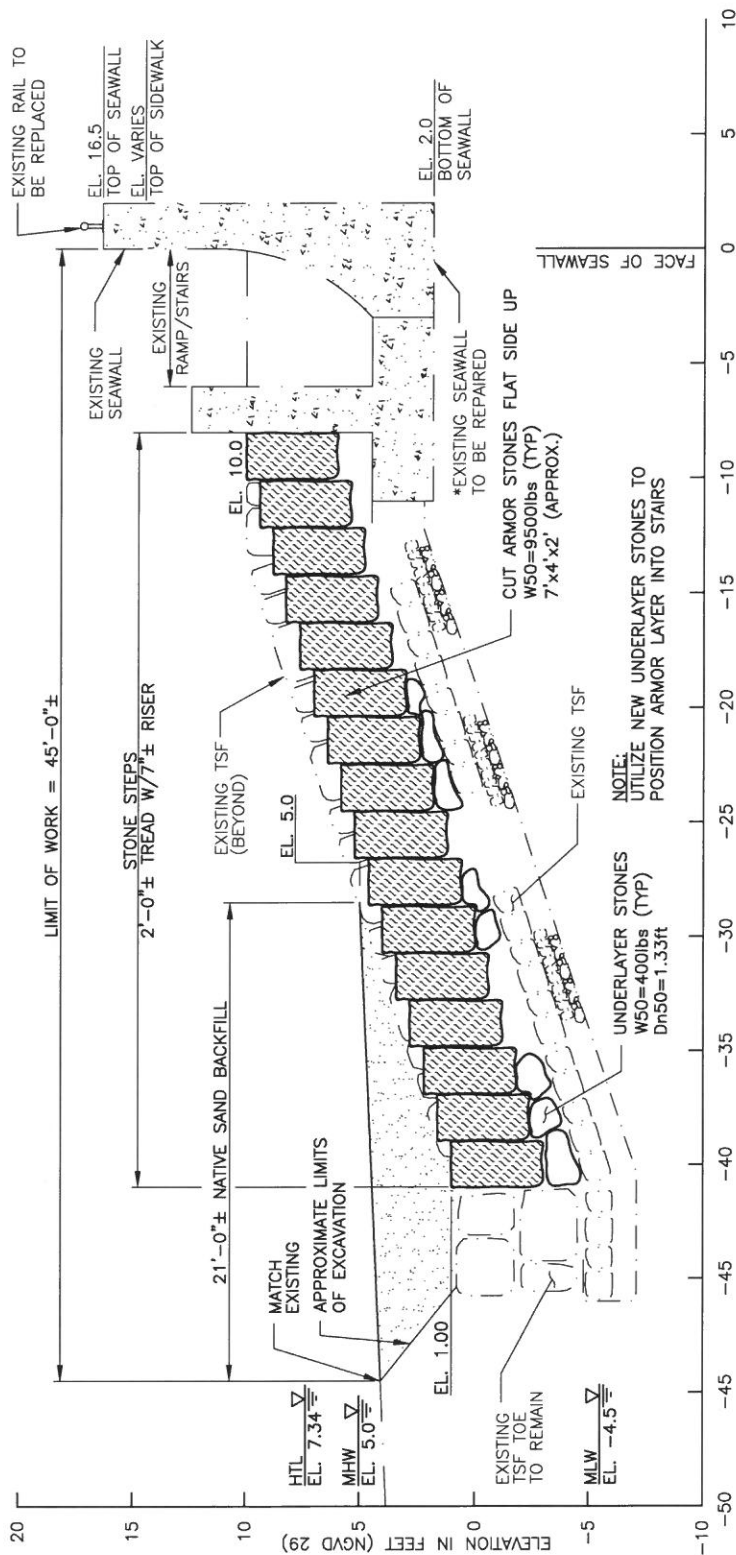
**SECTION 1**  
**ADA ACCESSIBLE RAMP**  
**(STAIRWAY 6 AND VEHICLE RAMP 1)**

HTL = HIGH TIDE LINE

\* SEAWALL REPAIRS INCLUDES SEALING OF CRACKS, JOINT REPAIRS, AND REPAIRING SPALLED OR DETERIORATED CONCRETE





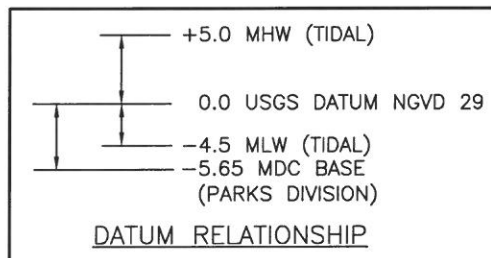
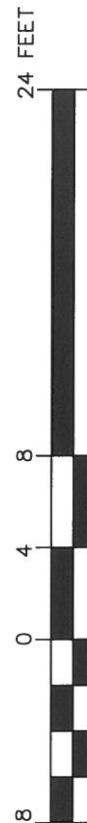


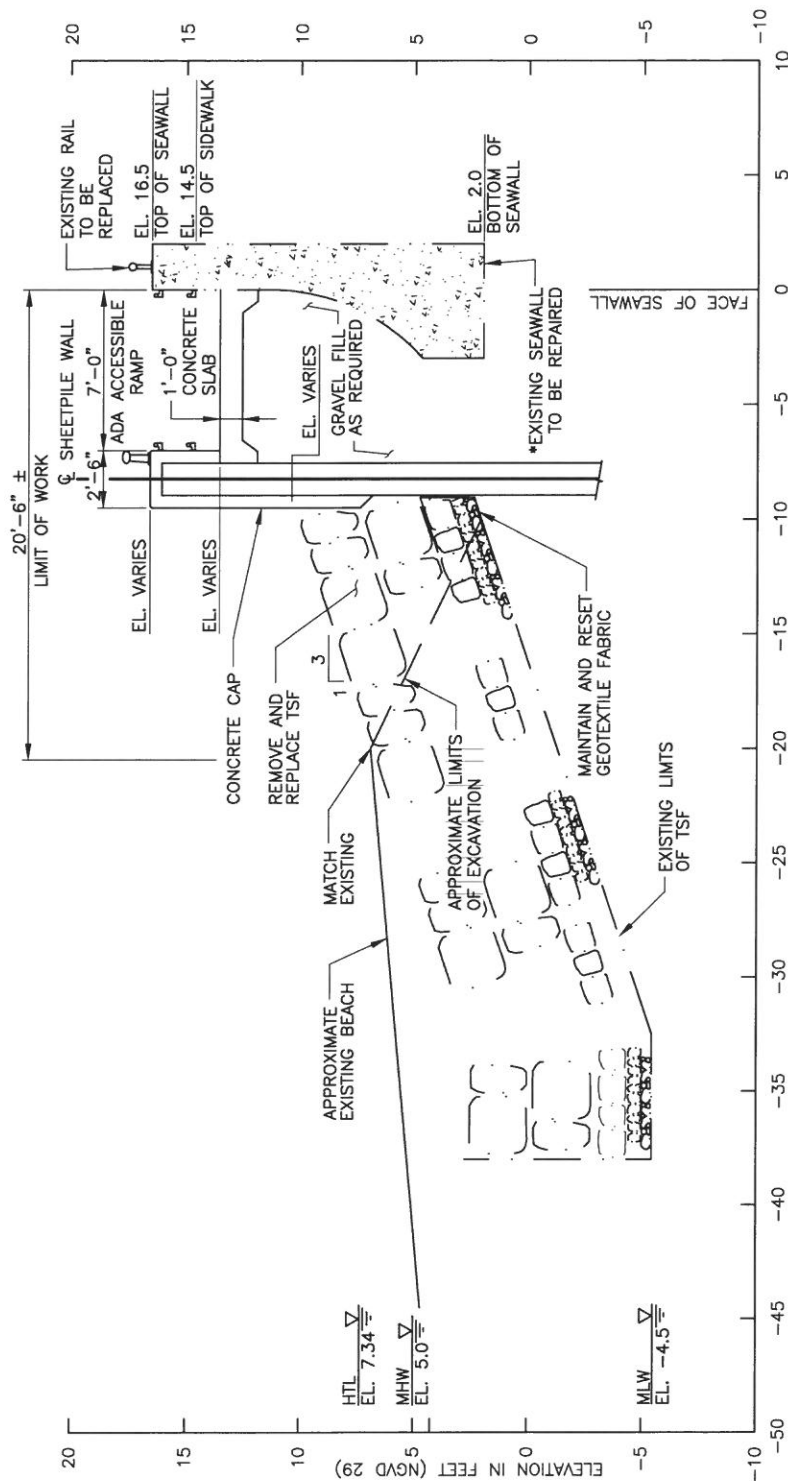
## SECTION 2 STONE STEPS AT EXISTING ACCESS LOCATIONS

1/8" = 1'-0"

HTL = HIGH TIDE LINE

\* SEAWALL REPAIRS INCLUDES SEALING OF CRACKS, JOINT REPAIRS, AND REPAIRING SPALLED OR DETERIORATED CONCRETE





### SECTION 3 ADA ACCESSIBLE RAMP (RAMP 9)

HTL = HIGH TIDE LINE

\* SEAWALL REPAIRS INCLUDES SEALING OF CRACKS, JOINT REPAIRS, AND REPAIRING SPALLED OR DETERIORATED CONCRETE

